

CLAIMS

1. A procedure to create a fleece (44) made of fibers (14) with numerous hole structures (36) extending over the entire cross-section of the fleece (44), whereby:

- in a first step, the fibers (14) are randomly placed on a perforated belt (16) to form a fibrous web (18),
- in a second step, the fibrous web (18) is transported to a hole-structure-creating unit (20; 20a),
- in a third step, the hole structures (36) are created by mechanically displacing the fibers (14), whereby the displacement of the fibers (14) does not influence their mechanical and chemical structure, and
- in a fourth step, the fibrous web (18) with the hole structures (36) is bonded in a bonding unit (38; 38a) to form a fleece (44).

2. A procedure according to claim 1, characterized in that the fibrous web (18) is transformed by stiffening and thermobonding to form a fleece (44).

3. A procedure according claim 2, characterized in that before the third step, the fibrous web (18) is prebonded so that the tensile strength of the prebonded fibrous web (18) is 0.1 to 75 % and especially 50 % of the tensile strength of the bonded fleece (44).

4. A procedure according to ~~one of~~ claims 1-3, characterized in that the fibers (14) surrounding the

hole structures (36) are fixed before feeding the fibrous web (18) to the bonding unit (38; 38a).

5. A procedure according to ~~claims 1-4~~, characterized in that the fibrous web (18) is fed directly to the bonding unit (38; 38a) after the hole structure (36) is created.

6. A procedure according to claim 5, characterized in that the fourth step directly follows the third step.

7. A procedure according to ~~one of claims 1-6~~, characterized in that the hole-structure-creating unit (20; 20a) has two elements (22, 26; 40a) with facing surfaces (24, 28; 28a) between which the fibrous web (18) is guided, whereby the surface (24) of a first element (22) has numerous barbs (30) facing the fibrous web (18), and whereby the surface (28; 28a) of a second element (26; 40a) has openings (32, 32a) in which the barbs (30) of the first surface (24) can at least partially enter, whereby the fibers (14) of the fibrous web (18) below the barbs (30) are displaced without being destroyed when the barbs (30) sink into the openings (32; 32a) and the hole structures (36) are formed.

8. A procedure according to claim 7, characterized in that the openings (32; 32a) of the second surface (28; 28a) communicate with a vacuum source (34) such as a blower so that fibers (14) of the fibrous web (18) in the area of the openings (32; 32a) are sucked into the openings (32; 32a).

9. A procedure according to claim 7, characterized in that the openings (32; 32a) of the second surface (28; 28a) communicate with a pressure source (34) such as a blower so that fibers (14) of the fibrous web (18) in

the area of the openings (32; 32a) are blown out of the openings (32; 32a).

10. A procedure according to claims ~~7-9~~, characterized in that the first element (22) is a roller (22).

11. A procedure according to claim 10, characterized in that the roller (22) has a diameter of 100-500 mm.

12. A procedure according to claims ~~7-11~~ and ~~8~~, characterized in that the first element (22) is a lowering and raising plate.

13. A procedure according to ~~one of~~ claims ~~7-12~~, characterized in that the barbs (30) of the first element (22) are conical.

14. A procedure according to ~~one of~~ claims ~~7-12~~, characterized in that the barbs (30) have an involuted shaped.

15. A procedure according to ~~one of~~ claims ~~7-12~~, characterized in that the barbs (30) have an ogival cross-section.

16. A procedure according to ~~one of~~ claims ~~7-15~~, characterized in that the barbs are 0.5-5 mm high.

17. A procedure according to ~~one of~~ claims ~~7-16~~, characterized in that the second element (26) is a perforated belt (26).

18. A procedure according to ~~one of~~ claims ~~7-16~~, characterized in that the second element (40a) is a calender roller (40a).

19. A fleece (44) created according to a procedure in ~~one~~

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of claims ~~1-18~~, characterized in that the hole structures (36) have a diameter of 0.5-5 mm.

20. A fleece according to claim 19, characterized in that the bonding surface is 3-40 % of the fleece surface.

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21. A fleece according to claim 19 or 20, characterized in that the number of bonding points (48) is 20-120 per square centimeter.

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22. A fleece according to ~~one of~~ claims 19-21, characterized in that the shape of the hole structures (36) is noncircular.

23. A fleece according to ~~one of~~ claims 19-22, characterized in that the distance between individual hole structures (36) is irregular.

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24. A fleece (44) manufactured according to ~~one of~~ claims 1-23, characterized in that the fibrous web (18) is bonded to at least one other sheet medium before creating the hole structures (36).

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